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WORKING GROUP ON THE EVALUATION
OF THE HAZARDS OF HARMFUL
SUBSTANCES CARRIED BY SHIPS
32nd session
Agenda item 11

REPORT OF THE THIRTY-SECOND SESSION

1 INTRODUCTION

1.1 The thirty-second session of the GESAMP Working Group on the Evaluation of the Hazards of Harmful Substances Carried by Ships was held at IMO Headquarters, London, from 20 to 24 May 1996 under the chairmanship of Dr. P.G. Wells.

1.2 The IMO Technical Secretary of GESAMP, Dr. M. Nauke, welcomed the Working Group on behalf of the Secretary-General of IMO and the Director of its Marine Environment Division. Dr. Nauke emphasized the importance of the work to be carried out at this session with regard to the suggested revision of Annex II of MARPOL 73/78, and also in relation to the international efforts that are being made in harmonizing criteria used for the classification of environmentally hazardous substances. He further noted that over the intersessional period there also have been many requests from the chemical industry and national maritime administrations to evaluate new substances, or to review existing hazard profiles in light of new data.

1.3 A list of members of the EHS Working Group is shown in annex 1. The agenda for this session, as adopted by the Working Group, is shown in annex 2.

2 MATTERS ARISING FROM THE TWENTY-SIXTH SESSION OF GESAMP

2.1 The Working Group was informed that GESAMP, noting the outcome of the IMO/GESAMP Expert Panel on Procedures for the Evaluation of Hazards of Harmful Substances Carried by Ships, fully supported the proposals made by the Working Group at its 31st session concerning the review of current evaluation procedures. In this connection GESAMP, in response to remarks made at the expert panel meeting "that it was the position of several national scientific institutions that there was currently no way of reliably assessing the toxicity of mixtures of chemicals, whether the effects were antagonistic, synergistic or additive", pointed out that there was indeed much public concern, but very little evidence to date of synergistic effects from chemicals and mixtures in the marine environment.

2.2 The Working Group noted that GESAMP welcomed the efforts made in keeping a watching brief on the use of triazine-based herbicides in antifouling paints and on potential ecological effects of oestromimetic chemicals. The Working Group was requested to report back to GESAMP XXVII on these issues.

3 MATTERS ARISING FROM IMO AND OTHER ORGANISATIONS RELEVANT TO THE ACTIVITIES OF THE WORKING GROUP

3.1 The Secretary informed the Working Group of the outcome of meetings held within and outside IMO which was relevant to its work and future developments in the field of chemical hazards' evaluation.

IMO Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC)

3.2 The Working Group was informed that the DSC Sub-Committee at its first meeting in February 1996, noted the proposals and recommendations made by the IMO/GESAMP Expert Panel on Procedures for the Evaluation of the Hazards of Harmful Substances Carried by Ships which had met at IMO Headquarters from 23-25 August 1995.

3.3 In connection with proposals made by the Expert Panel on measures that might be taken to harmonize classification criteria for environmentally hazardous substances, the Sub-Committee was informed that OECD had been assigned an advisory role regarding the arrangements that were needed to promote and facilitate the harmonization process.

3.4 The Working Group noted that the DSC Sub-Committee has welcomed the activities of the Group carried out in response to the recommendations of the above expert panel.

IMO Sub-Committee on Bulk Liquids and Gases (BLG)

3.5 The Working Group was informed that the BLG Sub-Committee at its first session (4-8 March 1996) welcomed information provided on the current review of the rationale for hazard evaluations, noting that the scientific approach to hazard and risk evaluation of chemicals has moved on considerably since the early 1970's. The Sub-Committee further recognized that there was a growing need to harmonize IMO provisions with other regulatory systems and that there have been frequent calls from industry for uniformity in providing test data.

3.6 At the Sub-Committee's session several participants expressed their view that, ideally, a harmonized profile should be developed and made available as a basis for all categorization and labelling systems.

3.7 With regard to current harmonization efforts that are being made world-wide by a number of organizations, the importance of the OECD Advisory Group (see paragraph 3.3 above) was particularly emphasised by the BLG Sub-Committee. The Sub-Committee recommended that a representative of GESAMP/EHS should participate in the next session of the OECD Advisory Group, Paris, 20-21 June 1996. The Working Group concurred with this view, and accordingly requested IMO to take the appropriate steps.

3.8 The Working Group was requested to comment on three documents that had been submitted to the BLG Sub-Committee as follows:

BLG 1/3/6 (Norway)
BLG 1/3/18 (Germany)
BLG 1/INF.10 (The Netherlands)

3.9 Document BLG 1/3/6 entitled "Possible revisions to the GESAMP hazard profile system" was discussed by the Working Group. The Group felt that the paper had been prepared without full and accurate knowledge of the process and technical details of the GESAMP hazard evaluation procedure or its context, i.e. to evaluate hazards based on inherent characteristics and to provide IMO with scientific data

and advice for the development of measures concerning the transportation of chemicals, operational discharges of residues into the marine environment, as well as appropriate responses to accidental spillages. This is a different scope and carried out under a different mandate than that of the Oslo and Paris Commissions (OSPARCOM). It was therefore not appropriate for GESAMP to strictly and solely use data from the testing protocols recommended by these organizations. In addition, it was felt that the degree by which the GESAMP hazard evaluation procedures are being revised to harmonize with other international hazard evaluation schemes was not well understood by the authors of the document. The Working Group also noted that any criticisms concerning the use of the various elements of the hazard profile should be addressed to IMO, and were not a matter to be commented on by the Group. A number of issues raised in the submission have been the subject of detailed consideration by the Working Group since it had been established in 1974. The Working Group concluded that the paper BLG 1/3/6 was misdirected in its views and technical content and unhelpful in the aim of achieving progress towards better harmonization and technical rigour in schemes for marine hazard assessment of chemical substances.

3.10 Document BLG 1/3/18 provides advice on the inclusion of biological degradability in the hazard assessment to liquid bulk chemicals, and actually welcomed the proposal of the Working Group to include biodegradability ratings in hazard profiles. The advice provided in that document was taken into account by the Working Group.

3.11 Document BLG 1/INF.10 introduces a number of new parameters for use in a harmonized approach of criteria, proposing a flexible system that would respond to the different demands of the users. The Working Group recognized that the parameters and its rating bands proposed in the document have been the subject of its own discussions during the review process. In general, throughout its work the Group has used the approach proposed in that document.

4 REVIEW OF THE GESAMP HAZARD EVALUATION PROCEDURES

4.1 The Working Group continued its review, building its discussions on the results and decisions made at its 31st session, and structuring these around the columns of a revised hazard profile. The Working Group agreed that as a matter of principle the arrangements within a revised system should be compatible with the grouping of the existing hazard profile; this would avoid confusion between the users of the different evaluation rationales.

Column A: Bioaccumulation and Biodegradation

4.2 The Working Group agreed that bioaccumulative tendencies and potential biodegradabilities of substances should be reflected in sub-columns under column A. The **Bioaccumulation** sub-column (A1) should contain two sets of information:

A1a the log octanol/water partition coefficient (log Pow), and
A1b the bioconcentration factor (BCF) measured with fish or shellfish as target organisms.

4.3 The Working Group recalled that log Pow values tend to provide conservative data, whereas a measured BCF does provide definitive information on the potential of a substance to bioaccumulate under "steady state" conditions. The measured BCF often might result in less severe hazard ratings, due to processes such as metabolism which may enhance excretion of a chemical. In the case where both BCF and log Pow data were provided, the BCF would overrule the log Pow. Substances with very high log Pow values (>ca7) are presumed to be so insoluble in water as to pose no further potential for bioaccumulation. Determining the exact cut-off point requires further consideration.

4.4 The Working Group reiterated that log Pow values are applicable to organic chemicals only. To assess the bioaccumulation potential of non-organic compounds, some surfactants, and some organo-metallic compounds, bioconcentration measurements have to be carried out.

4.5 The Working Group advised that the following testing methods should be recommended:

log Pow: OECD 107, OECD 117, or a slow stirring method;

BCF: OECD 305C, OECD 305E, the recently revised OECD 305 flow through test, or equivalent methods (e.g., ASTM and US-EPA methods).

4.6 For "Bioaccumulation" in sub-column A1 a ranking scheme was developed as follows:

0 - No potential to bioaccumulate
(*log Pow <1 or >ca7*; *no measurable BCF*)
1 - Very low potential to bioaccumulate
(*log Pow 1 - <2; BCF 1 - <10*)
2 - Low potential to bioaccumulate
(*log Pow 2 - <3; BCF 10 - <100*)
3 - Bioaccumulated to moderate extent
(*log Pow 3 - <4; BCF 100 - <1000*)
4 - Bioaccumulated to high extent
(*log Pow 4 - <5; BCF 1000 - <5, 000*)
5 - Bioaccumulated to very high extent
(*log Pow 5 - <7; BCF 5,000 - >5, 000*)

4.7 With regard to **biodegradation**, the Working Group noted that substances are considered within the European Union "readily biodegradable", if in 28-day biodegradation studies the following levels of degradation are achieved:

- in tests based upon dissolved organic carbon (DOC): 70%; and
- in tests based upon oxygen depletion of carbon dioxide generation: 60% of the theoretical maxima.

4.8 The tests to be applied should preferably be those developed for marine environments, e.g., OECD 306; however, freshwater tests, e.g., OECD 301 A-F series, or ISO and ASTM equivalents, are also acceptable.

4.9 The information to be included as ratings in Column A2 (Biodegradability) should be expressed as:

R = readily biodegradable
NR = not readily biodegradable
NI = No information available (see also paragraph 4.34 below)

Column B: Aquatic Toxicity

4.10 The Working Group confirmed its earlier decision that column B should be divided into two sub-columns, one representing results from acute aquatic toxicity tests, and a second sub-column to contain information on the chronic toxicity of the respective substance, wherever available or appropriate.

4.11 With regard to **"acute toxicity"** the Working Group confirmed that the acute toxicity ratings should cover the range from > 1000 mg/l down to <0.01 mg/l.

4.12 Data from the following three standard tests should be used:

- a 96 hr LC_{50} fish test;
- a 48-96 hr LC_{50}/EC_{50} crustacean test; and
- a 72 hr IC_{50} microalgal growth inhibition test;

The lowest LC_{50}, EC_{50} or IC_{50} (i.e., the test showing the highest toxicity) should be used to assign the hazard rating.

4.13 The test data bands and their ratings that should be included in column B1 (Acute toxicity) were agreed as follows:

B1 Acute toxicity

0	-	non-toxic (*> 1000 mg/l*)
1	-	practically non-toxic (*100 - 1000 mg/l*)
2	-	slightly toxic (*10 - 100 mg/l*)
3	-	moderately toxic (*1 - 10 mg/l*)
4	-	highly toxic (*0.1 - 1 mg/l*)
5	-	very highly toxic (*0.01 - 0.1 mg/l*)
6	-	extremely toxic (*< 0.01 mg/l*)

4.14 In relation to "**chronic aquatic toxicity**" the Working Group recalled that it had previously suggested that information on chronic toxicity would be very useful in resolving conflicts between acute toxicity and bioaccumulation test data, particularly in the case of poorly soluble substances. It further expressed the view that in cases where acute toxicity/bioaccumulation data were conflicting, chronic data may help to decide as to whether the substance was so insoluble as to pose no hazard, or whether indeed it might pose a hazard to the marine environment.

4.15 The Working Group proposed that chronic toxicity tests should be applied for substances with relatively high hazards based on their acute toxicity, bioaccumulation or persistence. Such tests could include - the 28 day extended fish test (OECD), the 21 day *Daphnia* reproduction test (OECD), or a 28 day early life stage fish or invertebrate test. Data from either marine or freshwater standard tests were deemed appropriate.

4.16 It was agreed that results should be expressed as a Median Effective Concentration EC_{50}. The use of No Observed Effect Concentration (NOEC) still needs to be considered by the Working Group. The use of acute to chronic ratios was felt to be overly complex and impracticable for the purpose of this hazard evaluation.

4.17 Where definite chronic effects are suspected, e.g., oestromimetic, reproductive, etc., a hazard may be indicated by placing a value in column B2 if a dose/effect relationship is known, or by placing a

statement in the remarks column. The exact expression of the rating is still under consideration by the Working Group.

Column C: Acute mammalian toxicity by swallowing, skin penetration and inhalation

4.18 The Working Group agreed that under Column C the hazards related to three potential exposure routes should be described: ingestion, skin contact and inhalation. It further noted that in determining the hazard rating, values from the most susceptible mammalian species should be used, except if there was convincing evidence that toxicity in humans might be different. With regard to vapour inhalation it was noted that LC_{50} values should be the result of a 4 hour exposure time. In the case where information was only available for other exposure times, these values would have to be extrapolated, taking into account physicochemical properties and known biological activity.

4.19 The Working Group confirmed that wherever possible, ratings for **peroral toxicity** should be derived from acute LD_{50} data based on standard 14 day post-dosing observation tests with rats, such as OECD 401, 402 and 403. However other test data obtained from literature using other protocols for other mammalian species could be used, if considered acceptable, after careful review. With regard to **inhalation toxicity**, data from standard tests with rats as test animals are preferred, using 4 hr LC_{50} studies where possible. For **percutaneous toxicity**, ratings data from standard tests with rabbits are preferred, using 24 hour occlusion with two weeks of observations.

4.20 The ratings and the data on which these should be based are as follows:

Rating	Relative Hazard	Peroral (mg/kg)	Percutaneous (mg/kg)	Vapour Inhalation (ppm)
0	Negligible	> 2000	>2000	>5000
1	Slight	500-2000	1000-2000	2500-5000
2	Moderate	50-500	200-1000	500-2500
3	Moderately high	5-50	50-200	50-500
4	High	<5	<50	<50

Column D: Irritation, corrosivity, and evidence for specific health concerns

4.21 The Working Group confirmed that, in a revised rationale, **skin irritation and eye irritation** should be rated separately. It further considered the introduction of a new sub-column on other specific health concerns. The Group agreed that for both **sub-columns on skin irritation and eye irritation** a numerical rating system should be used. Column D with these sub-columns was developed as follows:

Tissue	Rating	Hazard
Skin	0	Not irritating *(no clinical signs of injury and/or inflammation)*
	1	Slightly irritating *(mild erythema without perceptible swelling; reversible)*

Tissue	Rating	Hazard
Skin (Cont'd.)	2	Moderately irritating *(marked erythema with obvious swelling)*
	3	Highly irritating and corrosive *(marked erythema, severe oedema, corrosive by 4 hour occluded contact; other signs of tissue injury, e.g., ulceration, ecchymoses)*
	4	Severely irritating and severely corrosive *(severe erythema, severe oedema, corrosive by 3-minute occluded contact, other indications of severe tissue injury, e.g., ulceration, ecchymoses, sloughing)*
Eye	0	Not irritating *(no clinical signs of injury and/or inflammation)*
	1	Slightly irritating *(reversible conjunctival hyperaemia with or without chemosis)*
	2	Moderately irritating *(marked conjunctival, obvious chemosis, transient mild corneal injury)*
	3	Highly irritating and corrosive *(severe and sustained conjunctoblepharitis and chemosis; moderate corneal injury which may be permanent)*
	4	Severely irritating and severely corrosive *(severe and sustained conjunctoblepharitis and chemosis; irreversible corneal injury, which may be associated with deformity, ulceration and vascularization of the cornea)*

4.22 The Sub-column on **specific health concerns** is intended to address issues concerning specific organ toxicity, long-term and chronic exposure-related adverse health effects. Their presence should be indicated by a simple "YES" note.

Column E: Interferences with other uses of the sea

4.23 The Working Group confirmed its views that the current column E should be expanded to cover potential effects of operational discharges and accidental releases of chemicals in relation to maritime transport on other uses of the sea, i.e. fisheries, use of coastal amenities, effects of viscous slick-forming substances on wildlife, the effects of sinking substances smothering the seabed. These could be included under three sub-columns:

E1: Tainting of seafood
E2: Interferences with coastal amenities
E3: Effects on wildlife and bottom habitats

4.24 The Working Group re-iterated its view that in the absence of data indicating the potential of a chemical to **taint seafood**, data on its sensory properties, demonstrated by its odour detection threshold in aqueous solution might be used. The relationship between the potential of a chemical to taint and odour detection thresholds in water has been emphasized in a number of studies prepared for the Working Group (see reports EHS 31/8, EHS 29/17, EHS 28/15, EHS 27/15).

4.25 The Working Group agreed that four ratings should be used to indicate in Sub-column E1 the **potential of a substance to taint seafood**. These were:

"Tt" - the substance has been tested for tainting seafood and found to taint at concentrations at or below 1 mg/l

"To" - the substance has been tested for its sensory properties (odour) and shown to have an odour detection threshold in aqueous solution at 1 mg/l or below

"Ta" - the substance is liable to taint seafood in analogy with other similar chemicals of its group.

"0" - the substance has been tested for tainting and found not to taint below 1 mg/l; or the odour detection threshold in water is above 1 mg/l; or consideration of properties of a .substance indicates that it is not liable to taint.

4.26 In regard to **interferences with coastal amenities**, the Working Group confirmed that the current rating system which indicated the degree and severity of interferences with "Xs" should be replaced with numerals (0-3).

4.27 The Sub-column E2 on interferences with coastal amenities was developed as follows:

E2:

Rating	**Relative interference**	**Outcome**
0	None	None
1	Slightly objectionable	Warning may be issued but no interference with amenities and hence no closure
2	Moderately objectionable	Warning issued and possible partial closure of amenities due to short-term inconvenience
3	Highly objectionable	Warning issued leading to closure of amenities because of marked inconvenience or serious potential adverse health effects

4.28 The Working Group adopted guidelines for the above ratings as follows:

0 - No health problems from exposure to material
- Physicochemical properties will not produce inconvenience or potential physical hazards

1 - Material may produce mild irritant effects
- Physical properties of material may produce mild inconvenience

2 - Material remains on amenity and may cause physical hazards
- Objectionable odour but not associated with feelings of ill-health
- Material could produce mild acute toxic effects by common exposure routes

- Material is irritant but not corrosive
- Material is a skin sensitizer
- Evidence that exposure to the substance could produce long-term adverse health effects

3 - Material will persist on beach, resulting in physical hazards and increasing potential for exposure
- Objectionable odour that may result in symptoms of ill-health (e.g., nausea and headache)
- Likely to produce serious toxic effects from acute exposure conditions
- Severe irritant and/or corrosive
- Respiratory sensitizer
- Human carcinogen and/or other evidence for other serious long-term adverse health effects

4.29 The Working Group re-called that it had intended to consider in sub-column E3 **effects on marine wildlife and on benthic habitats** of substances entering the marine environment due to their unique physical/chemical properties. The Group agreed to use a descriptive rating system, i.e.:

Fv - viscous slick-forming substance, not likely to evaporate or to dissolve quickly

S - sinking substance that would deposit on the seabed, not likely to dissolve quickly

0 - substances that would rapidly disperse in air or water

4.30 The Working Group noted that within other fora, "floating" substances (F) are being identified by use of the following parameters:

-	Density	:	<1
-	Vapour pressure	:	$\leq$ 0.3 kPa at 20^0C
-	Solubility	:	$\leq$ 0.1% (liquids)
		:	$\leq$ 10% (solids)

4.31 The Working Group agreed that in addition to the above characteristics, the viscosity of a substance should be taken into account:

- Viscosity > ca 5cSt

A viscous slick-forming substance would be assigned with "Fv" in the hazard profile.

4.32 With regard to "sinking" substances (S), the Working Group noted that these have been defined in a European Classification System for Chemicals Spilled at Sea as substances with the following characteristics:

- Density >1 kg/m^3
- Solubility $\leq$ 0.1% (liquids)
- Solubility $\leq$ 10% (solids)

4.33 Several members of the Working Group expressed readiness to collect, during the intersessional period, the relevant physical data of main liquid bulk substances carried by ships to identify hazards that can be expressed in sub-column E3.

Column F: Remarks

4.34 The Remarks Column should be maintained in a revised evaluation system identifying the following:

- Relevant physicochemical properties (e.g., gas).
- Reactivity with sea water.
- Candidate chemicals for review. These are chemicals that need to be periodically reviewed by the GESAMP Working Group because of a deficiency of significant information, in particular with respect to suspicions that the material could produce serious adverse human or ecological effects (typical examples would include oestromimetic substances or food chain accumulation of carcinogens). The reasons for a review should be noted in the column.
- Specific health or environmental concerns. This identifies the nature of the known or potential health effects, the presence of which are highlighted in Column C. In particular, attention is drawn to the following:

  Aspiration hazard
  Lachrymator
  Convulsant
  Cholinesterase inhibitor (ChE inhibitor)
  High acute (peroral), (percutaneous), (inhalation) toxicity
  Severe irritant
  Sensitizer (skin and/or respiratory)
  Endocrine disruptor
  Immunotoxic
  Hematotoxic
  Methaemoglobin generator
  Phototoxic
  Photosensitizer
  Neurotoxic
  Delayed neurotoxicity
  Reproductive toxicity
  Testicular toxicity
  Development toxicity
  Delayed lung injury
  Epigenetic carcinogen
  Animal carcinogen
  Human carcinogen

General

4.35 The Working Group agreed that in cases where sufficient data were not available, or where the information submitted for evaluation were of poor or suspect quality, the note "NI" - "No Information Available" should be included in the respective column of the hazard profile.

Other considerations in relation to the hazard evaluation review
Glossary, Definitions

4.36 The Working Group considered a draft glossary prepared during the intersessional period. This contains definitions of the criteria and terms used in the hazard evaluation rationale. The draft glossary is shown in annex 3.

Data sheets for internal use

4.37 Different draft versions of data sheet forms were considered by the Working Group. Comments made during this session, as well as those that will be provided during the intersessional period, will be incorporated in a final draft to be presented at its next session with a view to adoption by the Working Group. The draft data form is set out in annex 4.

Composite List of Hazard Profiles

4.38 The Working Group considered proposals on how a future composite list should be formatted to incorporate the additional information and ratings that will be available after the revised hazard evaluation procedure has been adopted and entered into use. It further noted that the revised scheme may ideally include 19 columns which will not fit into a standard print-out page. A proposal was made to develop a format in which each substance would have a record consisting of a number of fields. Some of the fields would correspond to the current columns.

4.39 Members of the Working Group will, during the intersessional period, consider in detail the new format proposed at this session, taking into account advice on electronic data storage and retrieval that might be available at their home institutions.

Questionnaire for submission of data to IMO and to GESAMP

4.40 The questionnaire available through IMO, as sent out in MEPC/Circ.265, annex 8, needs to be revised. During the intersessional period members will submit their comments, and the Secretariat will make an attempt to incorporate these into a new computerised format.

4.41 In connection with the new data sheets, composite list and in particular a revision of the questionnaire, attention was drawn to the need for IMO to develop a comprehensive strategy and timeframe concerning the use of the different hazard profiles and of working with two evaluation rationales.

5 WORK CARRIED OUT INTERSESSIONALLY

5.1 The Working Group reviewed the results of tasks carried out intersessionally by individual members of the Group, and took action as described below. Hazard profiles developed or revised under this agenda item are shown in annex 6.

5.2 The Working Group noted that there was insufficient information available to rate columns C, D and E for **Potassium formate solution (75% or more)** [EHS No. 2121. As there was sufficient relevant information on sodium formate, and it was considered that the two compounds were sufficiently similar for a close comparison to be drawn between them, a new entry was created for sodium formate, and the profiles for potassium formate were confirmed by analogy with those for sodium formate.

5.3 A draft document was circulated by a member of the Working Group which gave **guidance on the preparation of test media** with poorly soluble mixtures for marine ecotoxicity tests. The members of the Working Group were invited to consider this document during the intersessional period and to send comments on it to its author for collation and consideration at the next meeting. The Working Group would also welcome comments from outside the Group. The draft text is shown in annex 5

5.4 In order to expand the range of aquatic toxicity **ratings under column B** to mark substances as "very highly toxic" (rating 5) and "extremely toxic" (rating 6), the Working Group reviewed the first 64 of those compounds in the Composite List of Hazard Profiles which currently carry ratings of "4" in column B, taking account of the aquatic toxicity information available from the files and additional information provided by members of the Working Group. The projected review will extend to 265 compounds and it is anticipated that this could be completed in time for the next meeting of the EHS Working Group. So far 14% of the entries examined have resulted in no change to the existing column B profile values, in 74% of the cases a change to a profile rating of "5" or "6" has been established as justified, and in 11% of cases the available information was not conclusive. A high proportion of the substances examined so far have been pesticides, but that this will not be representative for the whole exercise. In the case of 24 pesticide/herbicide entries, column B ratings were absent due to lack of data.

5.5 When attempts were made intersessionally to obtain information or samples of **sodium silicate solutions** for aquatic testing, the producer indicated that there was no longer any bulk transport of this substance at sea.

5.6 A discussion took place on the aquatic toxicities of a series of **nitroparaffin** entries in the Composite List. All available information confirmed the existing ratings, and no changes were made to any of the related hazard profiles.

5.7 The Working Group had sought information on the use and properties of **triazine pesticides** in relation to marine antifouling paints, but little had been found. One study paper existed in the Netherlands but was not yet available in English. However a watching brief will be maintained by all members for items of interest on this topic.

5.8 The Working Group reviewed the class of **alkyl ketones** and made a number of changes to ratings in columns A, B and C. The revised hazard profiles are recorded in annex 6 to this Report.

5.9 The Working Group considered the profiles under the two headings "**alkylbezenesulphonates, straight chain"** [EHS No.301] and "**alkylbenzenesulphonates, branched chain"** [EHS No. 301], and concluded that two new related headings should be created for "alkyl(C_{11}-C_{13}) benzenesulphonates, straight chain" and "alkyl(C_{11}-C_{13}) benzenesulphonates, branched chain", while retaining the current entries without specifying the chain length of the alkyl radicals. The revised entries with their associated hazard profiles are to be found in annex 6 to this report.

5.10 The Working Group considered the task of the rationalisation of the various existing entries in the Composite List covering **alcohol polyethoxylates**, including a proposal for the inclusion of the new substance: alcohol(C_{12}-C_{16}) poly(1-3)ethoxylates. The Working Group developed the following four headings to cover the existing range of entries for linear alcohol polyethoxylates:

Alcohol(C_8-C_{11}) poly(2.5-9)ethoxylates	[EHS No. 2094]
Alcohol(C_{12}-C_{16}) poly(1-6)ethoxylates	[EHS No. 0294]
Alcohol(C_{12}-C_{16}) poly(7-19)ethoxylates	[EHS No. 1481]
Alcohol(C_{12}-C_{16}) poly(>19)ethoxylates	[EHS No. 1482]

All other existing linear alcohol polyethoxylate headings were deleted. The two entries for secondary alcohol polyethoxylates , viz.:

Alcohol(C_5-C_{17})(*sec*) poly(3-6)ethoxylates	[EHS No. 0722]
Alcohol(C_5-C_{17})(*sec*) poly(7-12)ethoxylates	[EHS No. 0295]

are retained, but the Working Group will review ratings for columns D and E at the next meeting.

6 CORRESPONDENCE WITH THE CHEMICAL INDUSTRY

6.1 The Working Group discussed points raised in correspondence with the following manufacturers:

Bayer AG
Lubrizol Corporation
ARCO Chemical Co.
Huls Aktiengesellschaft
Ethyl Corporation
Exxon Chemical Co.
Akzo Nobel Chemicals Inc.

6.2 Problems relating to hazard profile ratings and nomenclature were addressed, and the resulting entries for the following substances are to be found in annex 6 of this report.

1-(4-Chloropheny)-4, 4-dimethylpentan-3-one
Dialkyldiphenylamines (LOA)
Sulfurized fat (C_{14}-C_{20}) (LOA)
Phosphate esters, alkyl(C_{12}-C_{14})amine (LOA)
Sulfurized polyolefinamide alkene(C_{28}-C_{250})amine (LOA)
Dodecyl hydroxypropyl sulphide
Alkylsulphonic acid ester of phenol [Mesamoll]
Alkyl(C_8-C_{40})phenol sulphide
Alkyl(C_4-C_{20}) ester copolymer
Ethyl *tert*-butyl ether
Poly(4-12)ethylene glycol alkyl(C_7-C_{11})phenyl ether. [Now deleted].
Nonyl(C_6-C_{12})phenol poly(4-12)ethoxylates
Alkyl(C_8-C_9)phenylamine in aromatic solvent (LOA)
HiTEC 4728 (LOA)
HiTEC 4738 (LOA)
Polyolefinamide alkene(C16+)amine (LOA)
Copper salt of long chain (17+)alkanoic acid (LOA)
Viscoplex 5011B
Triphenyl phosphate/*tert*-butylated triphenyl phosphates mixtures, containing 15 to 48% of triphenyl phosphate.

7 EVALUATION OF NEW SUBSTANCES PROPOSED FOR BULK CARRIAGE BY SHIPS

7.1 Twelve new substances were evaluated by the Working Group and hazard profiles were assigned. However one of the substances was an alcohol polyethoxylate, and this can be conveniently included within the scope of one of the newly created alcohol polyethoxylate entries listed under paragraph 5.10 above. The remaining eleven substances are listed together with their hazard profiles in annex 6. to this report.

For three of these substances much of the information provided with the proposals was inadequate and in these cases the company concerned will be asked to provide satisfactory test results to the Working Group.

7.2 The twelve substances examined are as follows:

N,*N*-Dimethyldodecylamine
Polyisobutenyl anhydride adduct
Alcohol(C_{12}-C_{16}) poly(1-3)ethoxylates
Low boiling alkylpyridines
3,5-Dimethylpyridine
Pyridine bases
Alkyl(C_8-C_{10}) polyglucoside(max. 65%) solution
Alkyl(C_{12}-C_{14}) polyglucoside(max. 55%) solution
Alkyl(C_8- C_{10})/(C_{12}-C_{14}) polyglucoside(> 60%/<40%)mixture solution (max 55% active material)
Alkyl(C_8- C_{10})/(C_{12}-C_{14}) polyglucoside(50%/50%)mixture solution (max 55% active material)
Alkyl(C_8- C_{10})/(C_{12}-C_{14}) polyglucoside(<40%/<60%)mixture solution (max 55% active material)
Copper sulphate (solution)

8 REVIEW OF DATA SHEETS

8.1 The Working Group recalled that the Secretariat had distributed to the members of the Working Group 100 data sheets to be examined from the viewpoint of correctness of entries, data, conclusions, etc. Members had also been requested to insert additional data or new information where available. The Working Group considered such a very time consuming exercise as a matter to be assigned with lower priorities, in particular since the maintenance of data files by IMO has shown continuous improvement over recent years.

8.2 The Working Group however also emphasized that there were many cases where groups of chemicals or columns of the hazard profiles need to be reviewed, in light of new data, results of impact assessments, and new users and applications.

8.3 The Group agreed that there should be a standing item on the agenda of its sessions "Chemicals of particular interest or concern (review)", under which members of the Group, or institutions outside GESAMP, could submit proposals for review.

9 FUTURE WORK AND DATE OF NEXT SESSION

The Working Group identified tasks to be carried out during the intersessional period by individual members of the Group as well as by the Secretary. The thirty-third session of the Group will be convened from 10 to 14 February 1997.

10 ANY OTHER BUSINESS

10.1 A communication from the US Coast Guard which identified discrepancies, inconsistencies and errors in the Names column of the Composite List had been received at IMO. Certain questions of principle that it raised concerning the use of identifiers for ISO approved common names for pesticides, lubricating oil additives, trade names and trade marks were addressed by the Working Group. The use of ISO and similar identifiers did not present any unresolvable problems with alphabetization of the names,

and was accepted by the Group. The difference between trade marks and trade names or trade named substances was discussed but some clarification was needed to resolve their meanings. The Secretariat was requested to consider the various individual points raised and insert amendments to the relevant entries as appropriate in due course before the next meeting of the Working Group.

Thiourea dioxide

10.2 The Working Group was informed of chemical incidents involving Thiourea dioxide , also shipped under the synonym "formamide sulfinic acid" (DSC 1/INF.14). In several cases containers loaded with these substances have emitted sulphurous gases. The violent exothermic decomposition may be triggered by heat, humidity, or by a combination of these factors.

10.3 Members of the Working Group were invited to submit any information they may have on the properties of thiourea dioxide to the Secretary.

Oestromimetic substances

10.4 The Working Group briefly reviewed publications and material made available by individual members of the Group concerning the environmental impact of oestromimetic substances, often also called "endocrine disruptors". It was noted that testing methods are still not efficient enough to predict potential effects on human and ecosystem health, and that it might be several years before chemical tests are available, in spite of efforts made at national and international institutions and by the chemical industry.

10.5 The Working Group proposed that GESAMP should consider establishing a special task team on this matter. The expertise needed to review the ongoing developments was beyond that available in the current Group. It was further emphasized that until screening tests had been developed and internationally recognizedand used, this matter was beyond the mandate of the Working Group.

The GESAMP/EHS database developed at the Norwegian University of Science and Technology

10.6 As already mentioned in the course of this session, a review of the evaluation procedures has to be accompanied by a reformatting of the basic storage unit, i.e., the data sheet forms, which should then correspond to the new composite list. The current database had been developed by the University of Trondheim, Norway, in a step by step manner over the last few years; it was originally intended for internal use by the Working Group only, but later developed for more general distribution. A re-organization of the data should be envisaged within the near future to facilitate electronic storage and flexible retrieval of data. The programme that had been used is now outdated with regard to efficiency, programme ability and user friendliness. The distribution of the database on disks also is slow and expensive.

10.7 The University of Trondheim intends to discontinue the current Dbase IV programme. It is therefore required that IMO develops and maintains a new programme, using the best available technology and state-of-the-art knowledge. The distribution of the database on disks is slow and expensive. The database could be made available on, for example, Internet-WWW for on-line searching or to be downloaded to a local computer. In both cases it could be accessed for a fee or as a subscription. A simple security system to avoid unintentional changes could be included. A new composite list, as discussed by the Working Group, would consist of hazard profiles containing up to 19 columns. These would not fit onto a standard print-out page. It was therefore proposed that each compound would have a record, and each record should consist of a number of fields. Some of these fields would correspond to the current hazard profile columns, thus facilitating the new hazard rating system.

10.8 The Working Group requested IMO to consider the possibility of developing a revised electronic database, taking into account new technologies and experience gained with the Dbase IV programme used for the current system. The system should be user-friendly and open. A data management expert would need about one week to transfer the current database into a modern state of the art format. Such work should be carried out at IMO during the intersessional period. If necessary, advice and expertise concerning the current database would be provided by the University of Trondheim.

11 CONSIDERATION AND ADOPTION OF THE REPORT

The Working Group considered and adopted the report of its thirty-second session on 24 May 1996.

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